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Technical Specification

3rd Generation Partnership Project; Technical Specification Group Services and System Aspects; Telecommunication management; Configuration Management (CM); Repeater network resources Integration Reference Point (IRP); Common Object Request Broker Architecture (CORBA) Solution Set (SS) (Release 9)

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Contents

Foreword

This Technical Specification has been produced by the 3rd Generation Partnership Project (3GPP).

The contents of the present document are subject to continuing work within the TSG and may change following formal TSG approval. Should the TSG modify the contents of the present document, it will be re-released by the TSG with an identifying change of release date and an increase in version number as follows:

Version x.y.z

where:

x the first digit:

1 presented to TSG for information;

2 presented to TSG for approval;

3 or greater indicates TSG approved document under change control.

y the second digit is incremented for all changes of substance, i.e. technical enhancements, corrections, updates, etc.

z the third digit is incremented when editorial only changes have been incorporated in the document.

The present document is part of a TS-family covering the 3rd Generation Partnership Project; Technical Specification Group Services and System Aspects; Telecommunication management; as identified below:

32.721: "Configuration Management (CM); Repeater network resources Integration Reference Point (IRP); Requirements".

32.722: "Configuration Management (CM); Repeater network resources Integration Reference Point (IRP); Information Service (IS)".

32.723: "Configuration Management (CM); Repeater network resources Integration Reference Point (IRP); Common Object Request Broker Architecture (CORBA) Solution Set (SS)".

32.725: "Configuration Management (CM); Repeater network resources Integration Reference Point (IRP); Bulk CM eXtensible Markup Language (XML) file format definition

Configuration Management (CM), in general, provides the operator with the ability to assure correct and effective operation of the 3G network as it evolves. CM actions have the objective to control and monitor the actual configuration on the Network Elements (NEs) and Network Resources (NRs), and they may be initiated by the operator or by functions in the Operations Systems (OSs) or NEs.

CM actions may be requested as part of an implementation programme (e.g. additions and deletions), as part of an optimisation programme (e.g. modifications), and to maintain the overall Quality of Service (QoS). The CM actions are initiated either as single actions on single NEs of the 3G network, or as part of a complex procedure involving actions on many resources/objects in one or several NEs.

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1 Scope

The purpose of this Repeater Network Resources IRP: CORBA Solution Set is to define the mapping of the IRP information model (see 3GPP TS 32.722 [4]) to the protocol specific details necessary for implementation of this IRP in a CORBA/IDL environment.

This Solution Set specification is related to 3GPP TS 32.722.

2 References

The following documents contain provisions which, through reference in this text, constitute provisions of the present document.

- References are either specific (identified by date of publication, edition number, version number, etc.) or non-specific.
- For a specific reference, subsequent revisions do not apply.
- For a non-specific reference, the latest version applies. In the case of a reference to a 3GPP document (including a GSM document), a non-specific reference implicitly refers to the latest version of that document *in the same Release as the present document*.

[1] 3GPP TS 32.101: "Telecommunication management; Principles and high level requirements".

[2] 3GPP TS 32.102: "Telecommunication management; Architecture".

[3] 3GPP TS 32.600: "Telecommunication management; Configuration Management (CM); Concept and high-level requirements".

[4] 3GPP TS 32.722: "Telecommunication management; Configuration Management (CM); Repeater Network Resources Model (NRM): Integration Reference Point (IRP): Information Service (IS)".

[5] 3GPP TS 32.300: "Telecommunication management; Configuration Management (CM); Name convention for Managed Objects".

[6] OMG Notification Service, Version 1.0.

[7] OMG CORBA services: Common Object Services Specification, Update: November 22, 1996.

[8] The Common Object Request Broker: Architecture and Specification (for specification of valid version, see [1]).

[9] 3GPP TS 32.303: "Telecommunication management; Configuration Management (CM); Notification Integration Reference Point (IRP): Common Object Request Broker Architecture (CORBA) Solution Set (SS)".

[10] 3GPP TS 32.111-3: "Telecommunication management; Fault Management; Part 3: Alarm Integration Reference Point (IRP): Common Object Request Broker Architecture (CORBA) Solution Set (SS)".

3 Definitions and abbreviations

3.1 Definitions

For terms and definitions please refer to 3GPP TS 32.101 [1], 3GPP TS 32.102 [2], 3GPP TS 32.600 [3] and 3GPP TS 32.642 [4].

3.2 Abbreviations

For the purposes of the present document, the following abbreviations apply:

CORBA	Common Object Request Broker Architecture
DN	Distinguished Name
IS	Information Service
IDL	Interface Definition Language (OMG)
IOC	Information Object Class
IRP	Integration Reference Point
MO	Managed Object
MOC	Managed Object Class
NRM	Network Resource Model
OMG	Object Management Group
SS	Solution Set

4 Architectural features

The overall architectural feature of Repeater Network Resources IRP is specified in 3GPP TS 32.722 [4].
This clause specifies features that are specific to the CORBA SS.

4.1 Notifications

Notifications are sent according to the Notification IRP: CORBA SS (see 3GPP TS 32.303 [9]).

5 Mapping

5.1 General mappings

Attributes modelling associations as defined in the NRM (here also called "reference attributes") are in this SS mapped to attributes. The names of the reference attributes in the NRM are mapped to the corresponding attribute names in the MOC. When the cardinality for an association is 0..1 or 1..1 the datatype for the reference attribute is defined as a MOReference. The value of an MO reference contains the distinguished name of the associated MO. When the cardinality for an association allows more than one referred MO, the reference attribute will be of type MOReferenceSet, which contains a sequence of MO references.

5.2 Repeater NRM Information Object Class (IOC) mapping

5.2.1 IOC RepeaterFunction

Mapping from NRM IOC RepeaterFunction attributes to SS equivalent MOC RepeaterFunction attributes

NRM Attributes of IOC RepeaterFunction in 3GPP TS 32.722 [4]	SS Attributes	SS Type	Support Qualifier	Read	Write
repeaterFunctionId	repeaterFunctionId	string	M	M	-
userLabel	userLabel	string	M	M	M
priority	priority	long	M	M	M
latitude	latitude	float	M	M	O
Longitude	longitude	float	M	M	O
ctrlConnMode	ctrlConnMode	ctrlConnMode	M	M	M
environmentInfo	environmentInfo	string	M	M	-
powerSwitch	powerSwitch	powerSwitch	M	M	M
ulAttenuation	ulAttenuation	long	M	M	M
dlAttenuation	dlAttenuation	long	M	M	M
firmwareVer	firmwareVer	string	M	M	-
repeaterType	repeaterType	repeaterType	M	M	-
repeaterFunction-ExternalUtranCell	repeaterFunctionExternalUtranCell	GenericNetworkResourcesIRPSystem::AttributeTypes::MOReference	M	M	-

6 Rules for management information model extensions

This clause discusses how the models and IDL definitions provided the present document can be extended for a particular implementation and still remains compliant with 3GPP SA5's specifications.

6.1 Allowed extensions

Vendor-specific IOCs may be supported. The vendor-specific IOCs may support new types of attributes. The 3GPP SA5-specified notifications may be issued referring to the vendor-specific IOCs and vendor-specific attributes. New IOCs shall be distinguishable from 3GPP SA5 IOCs by name. 3GPP SA5-specified and vendor-specific attributes may be used in vendor-specific IOCs. Vendor-specific attribute names shall be distinguishable from existing attribute names.

NRM IOCs may be subclassed. Subclassed IOCs shall maintain the specified behaviour of the 3GPP SA5's superior classes. They may add vendor-specific behaviour with vendor-specific attributes. When subclassing, naming attributes cannot be changed. The subclassed IOC shall support all attributes of its superior class. Vendor-specific attributes cannot be added to 3GPP SA5 NRM IOCs without subclassing.

When subclassing, the 3GPP SA5-specified containment rules and their specified cardinality shall still be followed. As an example, `ManagementNode` (or its subclasses) shall be contained under `SubNetwork` (or its subclasses).

Managed Object Instances may be instantiated as CORBA objects. This requires that the IOCs be represented in IDL. 3GPP SA5's NRM IOCs are not currently specified in IDL, but may be specified in IDL for instantiation or subclassing purposes. However, management information models should not require that IRPManagers access the instantiated managed objects other than through supported methods in the present document.

Extension rules related to notifications (Notification categories, Event Types, Extended Event Types etc.) are for further study.

6.2 Extensions not allowed

The IDL specifications in the present document cannot be edited or altered. Any additional IDL specifications shall be specified in separate IDL files.

IDL interfaces (note: not IOCs) specified in the present document may not be subclassed or extended. New interfaces may be defined with vendor-specific methods.

Annex A (normative): CORBA IDL, NRM definitions

A.1 IDL specification (file name "RepeaterNetworkResourcesNRMDefs.idl")

```
//File:RepeaterNetworkResourcesNRMDefs.idl
#ifndef _REPEATERNETWORKRESOURCESNRMDEFS_IDL_
#define _REPEATERNETWORKRESOURCESNRMDEFS_IDL_
#include "GenericNetworkResourcesNRMDefs.idl"
#pragma prefix "3gppsa5.org"
/**
 * This module defines constants for each MO class name and
 * the attribute names for each defined MO class.
 */
module RepeaterNetworkResourcesNRMDefs
{
      /**
       *  Definitions for MO class RepeaterFunction
       */
      interface RepeaterFunction : GenericNetworkResourcesNRMDefs::ManagedFunction
      {
          const string CLASS = "RepeaterFunction";
         // Attribute Names
         //
         const string repeaterFunctionId   = "repeaterFunctionId";
         const string priority          = "priority";
         const string latitude          = "latitude";
         const string longitude             = "longitude";
         const string ctrlConnMode      = "ctrlConnMode";
         const string environmentInfo = "environmentInfo";
         const string powerSwitch       = "powerSwitch";
         const string dLAttenuation   = "dLAttenuation";
         const string uLAttenuation   = "uLAttenuation";
         const string firmwareVer           = "firmwareVer";
         const string repeaterType      = "repeaterType";
         const string repeaterFunctionExternalUtranCell = "repeaterFunctionExternalUtranCell";
    };

      enum ctrlConnMode
      {
         GSM_SMS,
         WCDMA_SMS,
         CIRCLE_SWITCH_DATA_CSD,
            PACKAGE_SWITCH_DATA_IP,
            SERIAL_PORT
      };

       enum powerSwitch {ON,OFF};

     enum repeaterType
     {
       WIDE_BAND_REPT_FUNCTION,
       FREQ_SEL_REPT_FUNCTION,
       FIBER_REPT_FUNCTION,
       INDOOR_REPT_FUNCTION,
       FREQ_SHIFT_REPT_FUNCTION

     };
 };
#endif //_REPEATERNETWORKRESOURCESNRMDEFS_IDL_
```

Annex B (informative): Change history

Change history								
Date	**TSG #**	**TSG Doc.**	**CR**	**R**	**Subject/Comment**	**Cat**	**Old**	**New**
Sep 2006	SA_33	SP-060560	--	--	Submitted to TSG SA #33 for Information	--	--	1.0.0
Dec 2006	SA_34	SP-060747	--	--	Submitted to TSG SA #34 for Approval.	--	2.0.0	7.0.0
Sep 2007	SA_37	SP-070612	0001	--	Correct CORBA Solution Set Tables	F	7.0.0	7.1.0
Dec 2008	SA_42	--	--	--	Upgrade to Release 8	--	7.1.0	8.0.0
Dec 2009	-	-	-	-	Update to Rel-9 version	--	8.0.0	9.0.0